

depauperata, n. sp.,* *Trisetum interruptum*, Buckl., (= (?) *T. elongatum*, HBK.) *Bouteloua prostrata*, Lag. (*B. pusilla*, Vasey), *Scleropogon Karwinskyanus*, Benth., *Melica Porteri*, Scribn. (*M. mutica*, var. *parviflora*, Porter).

New Species of Uredineæ.

BY T. J. BURRILL.

The plants described below are from large collections in Illinois of leaf-fungi, mostly made by A. B. Seymour for the Illinois State Laboratory of Natural History, Normal, Illinois. A paper upon the Uredineæ of Illinois, containing a fresh description of all the species so far observed in the State, is now ready for publication, and will be issued in a bulletin of the State Laboratory. Much care has been taken with the identification. While the writer holds himself responsible for the conclusions reached, he is glad to acknowledge the invaluable assistance of Mr. Seymour in the difficult sifting of names and types. Since the collections were made several species found to be new among them have been described by others.

UROMYCES GENOTHERÆ.

I. Infected leaves somewhat involute or revolute; peridia irregularly scattered over both surfaces of the leaf, minute, short, roundish or slightly elongated.

* *MUEHLENBERGIA DEPAUPERATA*, n. sp. — Annual. Cæspitose. Culms erect, branched below, 1-4 inches high. Sheaths inflated, prominently striate, with membranous margins. Ligule elongated, variously cleft. Leaves $\frac{1}{2}$ -1 inch long, minutely hairy or scabrous on both sides, finely striate, margins a white, cartilagenous, scabrous line, point rigid, involute. Inflorescence simple, racemose, spikelets appressed to the angular rhachis, sessile or raised on short, stout pedicels. Empty glumes minutely scabrous, especially towards the point, $1\frac{1}{2}$ -2 lin. long, the upper a little longer than the lower—the lower more or less cleft and terminating in two unequal points, the upper long-pointed, entire. Flowering glume, hardly as long as the empty ones, smooth or sparingly hairy below, terminating in an awn 1-3 lin. long.

Mr. Lemmon also collected this species in the Huachuca Mts.

In the allied *M. Schaffaeri*, Fourn., the culms are usually taller, the empty glumes scarcely one-half the length of the flowering one, which is 2 lines long, and terminating in a very slender awn 6 to 7 lin. long.

EXPLANATION OF FIGURES.

- Spikelet of *Muehlenbergia depauperata*. 1.
- Floret of *Muehlenbergia depauperata*. 2.
- Spikelet of *Muehlenbergia Schaffaeri*. 3.
- Empty glumes of same. All enlarged to the same scale. 4.

gated, with a whitish, spreading or recurved irregularly lacerated border; spores pale, globose-angular, $15\ \mu$ in diameter.

II. Spots red, purple, indefinite; sori epigenous, roundish, soon naked, brown; spores subglobose, minutely echinulate, brown, $15-18$ by $16-24\ \mu$.

III. Spots same; sori roundish or oblong, epigenous and soon naked, or cauline and long covered by the epidermis, blackish; spores oval, elliptical or oblong, strongly thickened at the apex, broadly rounded or variously pointed, dark brown, $16-18$ by $24-30\ \mu$; pedicels about one and a half times the length of the spore, often broad, tinted, especially close to the spore.

On *Enothera linifolia*, Makanda, Ill., April 27, 1882. A. B. Seymour.

The æcidia occur on the cauline leaves, affecting all alike, but sparingly on the radical leaves; the uredo and telento forms are mostly confined to the radical leaves. The pedicels of the Uredospores are somewhat persistent.

UROMYCES SCIRPI.

II. and III. Amphigenous; spots brown, indeterminate; sori long covered by the epidermis, minute and rounded or larger oblong, sometimes confluent end to end, forming clusters up to one-fourth of an inch long, nearly black. II. Uredospores among the teleutospores, few, irregularly elliptical, yellowish brown, sparsely echinulate, $15-20$ by $27-36\ \mu$. III. Teleutospores clavate-elliptical, widest at the center, mostly pointed, brown, apex darker and thickened, about 18 by $32-42\ \mu$; pedicels stout, subhyaline, about the length of the spore.

On *Scirpus fluviatilis*, Champaign, Ill., August 13, 1881. A. B. Seymour.

The leaves are thickly mottled with conspicuous brown spots, not definitely circumscribed. The appearance is nearest to that of *U. spartinae*, Farl. of anything found, but is sufficiently distinct in the appearance of the sori and the larger, differently shaped spores.

UROMYCES GRAMINICOLA.

II. and III. Sori amphigenous, but more common on under surface, scattered, small, oblong or linear, soon uncovered, the ruptured epidermis ragged, but usually its remains plainly apparent; uredospores spheroidal or oval, minutely echinulate, $15-18$ by $18-23\ \mu$; teleutospores variable, subglobose, oval or oblong, smooth, apex rounded or angular, thickened, $12-18$ by $21-30\ \mu$; pedicel somewhat colored, thick, scarcely tapering below, once to twice the length of the spore.

On *Panicum virgatum*, McLean Co., July 20, 1881; *Elymus Virginicus*, Piatt Co., August 10, 1881. A. B. Seymour.

PUCCINIA TENUIS.

I. Hypophyllous, rarely also epiphyllous; æcidia clustered in little irregular groups or sparsely scattered, very small, short, the narrow border irregularly lacerated and recurved; spores subglobose, very minutely tuberculate, $14-18\ \mu$. (*Æcidium tenue*, Schw.)

III. Hypophyllous; spots small, often confluent, mostly yellow, with a broad blackish center; sori sometimes scattered, usually confluent, effused, slightly convex, covered by the epidermis, dull grayish black; spores oblong-clavate, slightly constricted, usually angular or variously conspicuously pointed, 15 by $40\ \mu$; pedicels hyaline or slightly colored, half as long as the spore.

On leaves of *Eupatorium ageratoides*, Bloomington, Ill., Sept. 3, 1879. A. B. Seymour.

PUCCINIA SEYMERIÆ.

III. Hypophyllous and on stems and calyces; spots definite, dark-colored; sori rather large, mostly crowded in conspicuous circular clusters a fifth of an inch in diameter, these sometimes confluent, dark brown; spores elliptical or oval, little constricted, obtusely rounded at the ends, smooth, wall firm, brown, 15-21 by 30-36 μ ; pedicel hyaline, broad, persistent, twice as long as the spore.

On *Seymeria macrophylla*, Bloomington, Ill., Sept. 2, 1879. A. B. Seymour.

This is perhaps near *P. veronicæ* (Schum.) (*P. veronicarum* DC.), from which it differs in the size of the sori, the shape of the spores, and especially the stout, persistent pedicels. In the form of *P. veronicæ*, with persistent pedicels, the spores are oblong to spindle form, as well as furnished with a thickened apex.

MELAMPSORA CROTONIS, (Cooke).

II. and III. Amphigenous; uredosori scattered, rather prominent, circular, cinnamon colored; uredospores obovate, sharply echinulate, produced on pedicels, 15-21 by 18-27 μ ; teleutosori irregular, scattered or somewhat confluent, slightly elevated, reddish-brown; teleutospores irregular, mostly elliptical or oblong, two or more celled, variously imbricated in an irregular layer, smooth, cell-contents granular, pale to dark brown, 11-15 by 30-42 μ .

Trichobasis crotonis, Cke. Grev. vi. p. 137.

On leaves of *Croton capitatum*, and *C. monanthogynus*, S. Ill., Oct., 1881; *Crotonopsis linearis*, La Salle Co., Sept., 1882. A. B. Seymour.

ÆCIDIUM DICENTRÆ.

Hypophyllous; æcidia uniformly and remotely scattered over the entire surface, rather large, prominent, border regularly segmented and quite uniformly and abruptly rolled, firm; spores subglobose or elliptical, epispore thin, minutely tuberculate, 10-13 by 11-16 μ ; spermogonia large, disk-like, rather distant in a single row on the margin of the leaf, reddish-brown.

On *Dicentra cucullaria*, Central and Southern Illinois, April and May, 1882. A. B. Seymour.

ÆCIDIUM ONOBRYCHIDIS.

Hypophyllous; spots distinct or confluent, somewhat effused, yellowish-brown; æcidia subcircinate, crowded, short, border abruptly recurved, rather coarsely dissected; spores subglobose or elliptical, epispore rather thin, studded with low, obtuse tubercles sometimes united in ridges, 19-24 μ ; spermogonia clustered in the center of spots mostly on the upper surface, minute, reddish-brown.

On *Psoralea Onobrychis*, La Salle Co., Ill., June 20, 1882. A. B. Seymour.

ÆCIDIUM DIODIÆ.

Hypophyllous, on the cotyledons and rarely lower leaves; spots distinct, small, greenish-brown; æcidia few, in little irregular clusters, small, short, border little or not at all recurved; spores subglobose or elliptical, epispore

rather thin, tuberculate, 17-21 by 21-30 μ ; spermogonia rather numerous, scattered, above, not found on many of the spots.

On *Diodia teres*, Johnson Co., Ill., May, 1882. A. B. Seymour.

ÆCIDIUM MYOSOTIDIS.

Hypogenous; æcidia uniformly distributed over the leaf, mostly somewhat densely crowded, rather large, somewhat prominent, the recurved border wide and rather coarsely divided; spores subglobose or elliptical, epispore thick, conspicuously tuberculate, 15-18 by 18-22 μ ; spermogonia numerous, uniformly scattered over both surfaces of the leaf, reddish-yellow.

On *Myosotis verna*, Cobden, Ill., April, 1882. A. B. Seymour.

The distribution of the æcidia is decidedly different from that of *Æ. asperifolii*, Pers., as described, as well as from the specimens at hand, and similarly different from those named *Æ. lycopsidis*, Desv., *Æ. lithospermi*, Thum., and *Æ. symphyti*, Thum. The three last are made synonyms of the first by Winter, and all are said to be the æcidia of *Puccinia rubigo-vere*.

The latter is common in Illinois in wide areas where *Myosotis* does not occur, and no other species of Borraginaceæ has been observed infested with *Æcidium*.

ÆCIDIUM PHYSALIDIS.

Hypogenous; æcidia uniformly, usually densely, distributed in patches over the leaf-surface, short, friable, soon becoming pulverulent; spores subglobose or elliptical, often angular, epispore rather thick, obscurely tuberculate, 13-15 by 15-21 μ ; spermogonia very abundant, hypophyllous, scattered over extended patches with or without æcidia, comparatively large, honey yellow.

On *Physalis viscosa*, Urbana, Ill., May 30, 1879. T. J. Burrill. There is an *Æcidium solani*, Mont. (Flora Chile 8. 38), of which no further information can be had.

ÆCIDIUM CROTONOPSIDIS.

Hypogenous, occurring upon the cotyledons, and less commonly upon the caulicle and lower leaves; spots distinct, dark colored, the affected cotyledons soon yellow, æcidia not numerous, irregularly clustered, short cylindrical, becoming coarsely divided and widely spreading, pseudo-peridium thin but firm; spores irregular, mostly elliptical, epispore rather thick, tuberculate, 12-15 by 15-18 μ ; spermogonia very few, scattered above.

On *Crotonopsis linearis*, Johnson Co., Ill., May, 1882. A. B. Seymour.

ÆCIDIUM TRILLII.

Hypophyllous; spots distinct or somewhat confluent, circular effused, yellowish; æcidia densely aggregated around a free central circular space, sometimes with a more or less distinct outer circle later in development, short, pseudo-peridium thin, fragile, soon after opening becoming pulverulent; spores subglobose, epispore very thin, smooth, 19-24 μ ; spermogonia very numerous, rather prominent, scattered, central, on both sides of leaf.

On *Trillium recurvatum*, Pine Hills, Union Co., Ill., April 24, 1882. A. B. Seymour.

Differs from *Æ. convallariæ* in the more fragile and fugacious æcidia, and in the smooth, very much thinner epispore.

ADDITIONAL SPECIES BY A. B. SEYMOUR.

PUCCINIA RANUNCULI.

III. Amphigenous but mostly epiphyllous; sori irregularly associated, often crowded but scarcely confluent, occupying large areas or the whole leaf surface, little elevated, circular, powdery, surrounded by the upturned edges of the epidermis, æcidium-like, cinnamon brown; teleutospores broadly elliptical, usually little or not at all constricted at the septum, ends rounded, vortex more rarely furnished with a low pale apiculus, thickly but minutely tuberculate, 18-23 by 22-39 μ ; pedicel hyaline, fragile, short, sometimes more or less lateral.

On *Ranunculus repens*, Riverside, Ill., near Chicago, June 2, 1883. J. C. Arthur.

The little warts of the epispore are scarcely visible in soaked specimens. The teleutospores sometimes germinate in the sorus in June. One-celled specimens are not uncommon, and some vary widely from the described type.

PUCCINIA CONOCLINII.

II. and III. Mostly hypophyllous; spots small, purple, often confluent over large areas, becoming pale; sori scattered, sparse or very numerous associated, not often confluent, uredosori cinnamon-brown, teleutosori dark reddish-brown; uredospores subglobose to oval, sharply echinulate, 18-25 μ ; teleutospores broadly oval, little constricted, ends rounded, wall thick, warty, 27 by 32-42 μ ; pedicel nearly hyaline, firm, crooked, very long, about three times the length of the spore.

On leaves of *Conoclinium caelestinum*, Pine Hills, Union Co., Ill., Sept. 11, 1882. F. S. Earle.

This is *P. centaureæ*, DC. of Berkeley's Notices of North American Fungi, Grev. III., p. 53, as ascertained by examination of the original specimen in Herb. Curtis, but differs from authentic specimens bearing this name in various exsiccati.

ÆCIDIUM CEPHALANTHI.

Hypogenous; spots distinct, brown, scarcely thickened; æcidia numerous, irregularly crowded, short, the strongly recurved narrow border abrupt, finely divided; spores large, subglobose or elliptical, epispore very thick, very conspicuously reticulately roughened, 28-36 by 33-43 μ ; spermogonia scattered over the upper side of the infected area, minute, reddish-brown.

On *Cephalanthus occidentalis*, Ravenswood, near Chicago, June, 1883, J. C. Arthur; Quincy, Ill., July, 1883, C. A. Hart.

To the above the following may be appended:

URED. HYDRANGÆ, B and C. Hypogenous; spots small, yellowish, more or less confluent, sori minute, scattered, few; spores obovate, produced on pedicels, minutely tuberculate, 12-18 by 16-24 μ .

On *Hydrangea arborescens*. This name is attached to specimens in the Curtis Herbarium, and published in Curtis's Cat. Plts. N. Car., p. 122, without description. The specimens from which the description is taken were collected by Mr. F. L. Earle, Cobden, Oct. 13, 1879, and determined by comparison with the original.